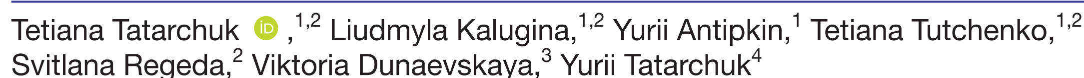
BMJ Open

Exploring awareness, attitudes and clinical practices of Ukrainian health professionals regarding human papillomavirus and vaccination: a qualitative study

Tetiana Tatarchuk  ,[1,2] Liudmyla Kalugina,[1,2] Yurii Antipkin,[1] Tetiana Tutchenko,[1,2] Svitlana Regeda,[2] Viktoria Dunaevskaya,[3] Yurii Tatarchuk[4]

To cite: Tatarchuk T, Kalugina L, Antipkin Y, *et al*. Exploring awareness, attitudes and clinical practices of Ukrainian health professionals regarding human papillomavirus and vaccination: a qualitative study. *BMJ Open* 2025;**15**:e089968. doi:10.1136/bmjopen-2024-089968

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (https://doi.org/10.1136/bmjopen-2024-089968).

Received 13 June 2024
Accepted 09 October 2025

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ABSTRACT

Introduction Cervical cancer, a preventable disease, remains a significant public health issue in Ukraine, characterised by low human papillomavirus (HPV) vaccination rates and systemic healthcare challenges exacerbated by the ongoing war. To improve the situation with HPV vaccination, understanding the perspective of healthcare professionals (HCPs) is crucial.

Aim This study aimed to assess the knowledge, awareness and clinical practices of Ukrainian HCPs regarding HPV, HPV-related diseases and vaccination. It sought to identify their readiness to recommend vaccination, the barriers they face and the impact of the full-scale Russia–Ukrainian war on these aspects.

Methods A qualitative exploratory study was conducted using the Knowledge, Attitude and Practice (KAP) framework. Data were collected through 12 focus group discussions, 10 in-depth semistructured interviews and short questionnaires with 60 HCPs (gynaecologists, paediatricians, general practitioners, nurses and key decision-makers) across four macroregions of Ukraine in July 2023. A descriptive thematic analysis was performed on the transcribed data.

Results The study found support for HPV vaccination among HCPs, who recognise it as a critical cancer prevention tool. However, significant barriers impede its implementation. These include organisational challenges like the vaccine's high cost and non-mandatory status, professional issues such as knowledge gaps and prevalent misconceptions (eg, belief in natural immunity, doubts about vaccine safety), particularly among non-gynaecological specialists, and low public awareness of the HPV–cancer link. The war has intensified these barriers by shifting priorities and disrupting services, yet it has also paradoxically increased vaccine awareness among Ukrainians who have been abroad.

Conclusion The successful rollout of Ukraine's national HPV vaccination programme requires a comprehensive strategy. Merely adding the vaccine to the schedule is insufficient. It must be accompanied by robust state funding to ensure it is free, a large-scale public information campaign to combat misinformation and raise awareness and targeted continuing medical education to close knowledge gaps and empower HCPs to recommend the vaccine confidently.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Qualitative design provides depth and prospects for future specific research, does not allow for statistical generalisation and Knowledge, Attitude and Practice framework limited analysis of layered qualitative data obtained.
- ⇒ The stratified sampling resulted in regional imbalances in medical specialisations, which may have skewed the perspectives from certain areas.
- ⇒ The study focused exclusively on the healthcare professional perspective.

INTRODUCTION

Despite being almost entirely preventable, cervical cancer (CC) continues to represent a significant and multifaceted public health threat in Ukraine, fuelled by the opportunistic nature of cervical screening, critically low human papillomavirus (HPV) vaccination rates and systemic healthcare challenges now profoundly exacerbated by the ongoing war.[1 2]

According to the Bulletin of the National Cancer Registry of Ukraine, 3398 new CC cases and 1499 deaths due to CC were registered in 2020 in Ukraine. In 2020, 33.9% of patients were diagnosed during preventive medical examinations, and 16% of women had lived less than 1 year since their diagnosis.[3 4] The World Bank analysis reported the presence of screening gaps in different regions. Specifically, screening captured only 47% of eligible women in the Lviv Region and 38% in the Poltava Region.[5] The COVID-19 pandemic resulted in a decrease in the detection rate of new cases of CC and an increase

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in the number of advanced stage cases (in 2020—30.5%, in 2021—31.1% of deaths). Data on HPV vaccination rates in Ukraine are insufficient, but the rates are most likely very low.[6–8]

The causal relationship between CC and 'high-risk' HPV infection persistence has been reshaping both primary and secondary CC prevention strategies internationally during the last decades.[9–11] Prophylactic vaccines are highly effective in preventing HPV infection and consequent pre-invasive and invasive cervical, vulvovaginal and anal disease.[12–14] The adoption of gender-neutral HPV vaccination in developed nations like Canada, the UK and the USA is recognised as a pivotal public health strategy for establishing robust herd immunity.[15 16] Two vaccines, the bivalent Cervarix and the quadrivalent Gardasil, have been registered and available for purchase in the private market since 2007 and 2009, respectively. Although Gardasil 9 was registered in Ukraine in 2023, it only became widely available on the private market in 2025, with a price of around €180 per dose. Prevaccination doctor's consultation and the administration of the vaccine incur additional costs, while the average monthly salary is around €550. Despite this long-term availability, the vaccines' impact has been minimal. The primary reason is their status as 'recommended' but not 'mandatory' or state-funded. Since 2016, there have been several regional and city programmes for free HPV vaccination of 9–14 years old girls in state hospitals which covered only a few regions/cities of the country. A significant policy change is planned. The Ministry of Health of Ukraine intends to include the HPV vaccine in the National Calendar of Prophylactic Immunisations (NCPI) starting in 2026.[17] This will allow for free single-dose vaccination, initially targeting girls aged 12–13, with the potential to expand the programme later. This initiative is seen as a critical step in the national strategy to combat CC. There are no guidelines for adult vaccination in Ukraine and existing practices align with international standards. For adolescents and young adults up to 26 years old, vaccination is recommended for those who were not vaccinated or did not complete the full series at a younger age. For adults aged 27–45 vaccination is possible, but it is typically based on medical indications, as the vaccine's effectiveness may decrease.[18]

A country's economic status is one of the strong determinants of vaccinations' programmes success including HPV vaccination. According to Ebrahimi,[19] only about 40% of low- and middle-income countries (LMICs) implemented vaccination, compared with over 80% of high-income countries. LMICs are also characterised by later introduction of HPV vaccines and slower implementation of vaccination programmes.[19] However, the experience of countries with well-organised HPV vaccination programmes still shows insufficient coverage determined by various factors.[20–22] At the same time, Rwanda's experience demonstrates that successful HPV vaccination programmes are achievable in low-resource settings. Despite initial challenges with an age-variable school-based catch-up campaign, the country achieved high first-dose coverage of 80–90% for girls routinely targeted as 12-year-olds.[23]

Healthcare workers play a key role in promoting HPV vaccination, overcoming limited awareness and various misconceptions in the community.[24] A qualitative systematic review of US healthcare clinicians' knowledge, attitudes and practices regarding HPV vaccination[9] showed that although clinicians were generally supportive of HPV vaccination, there was a discrepancy between clinicians' intentions, recommendation practices and patient vaccination rates.[20]

A systematic review of papillomavirus vaccination programmes identified knowledge gaps as barriers to implementation, such as LMICs-specific challenges: unavailability of the vaccine, lack of awareness and exclusion of HPV vaccination from national immunisation schedules. It also summarises actions for planning, implementation and sustaining high coverage of HPV vaccination programmes in the context of low-resource countries, but not all experiences of LMIC (like sub-Saharan region) can be applicable for Ukraine due to cultural and other differences.[25]

The new HPV vaccination policy has more chances for success if aligned with healthcare professionals (HCPs) needs as well as community cultural and social contexts. War has a unique multifaceted impact both on HCPs' practice and vaccine recipients' behaviour. Therefore, an in-depth qualitative study is essential to understand the interplay of these factors. By exploring the knowledge, awareness and practices of Ukrainian HCPs within this unprecedented wartime context, we can identify critical leverage points and potential obstacles to ensure the successful rollout of the national HPV vaccination programme.

The aim of this research is to explore knowledge and awareness of HPV infection and HPV-related diseases among HCPs, to understand the level of readiness to recommend HPV vaccination and barriers to do it among HCPs as well as to study the impact of war on all aspects of HPV vaccination from the perspective of HCP.

METHODS

This article presents a subset of results from the larger study.

Design

A qualitative exploratory design was employed using the Knowledge, Attitude and Practice (KAP) framework to investigate beliefs and attitudes towards gender-neutral HPV vaccination among HCPs in Ukraine. Additionally, the Health Belief Model (HBM) framework was integrated during the guideline development stage and data analysis (the HBM posits that the more a person perceives a health problem as real and serious, the more likely they are to take measures to prevent it).

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Data was collected through focus group discussions (FGDs), in-depth individual semistructured interviews (ISI) and short questionnaires.

Recruitment and sampling

HCPs who met the following criteria were recruited for the study: (1) had work experience with patients who could be at risk or have/had the HPV infection/HPV-related diseases or need to be/have been vaccinated against HPV infection, (2) were living in a place of residence and macroregion that they represent permanently before the war started, (3) were willing and able to sign the informed consent form (online supplemental table 1).

A combination of snowball and chain-referral methods was applied to recruit participants (through the network of recruiters, and with the help of medical expert recommendations (for the scientific leaders (SLs) and key decision makers (KDMs) subgroup)). Following the FGDs, 10 HCPs were selected at the discretion of the investigator and invited for in-depth semistructured interviews. Interview candidates were selected based on unexpressed thoughts from FGDs, unique opinions and high expertise according to the moderator's observations.

Data collection

The appropriate number of focus groups was determined based on thematic or data saturation referring to the point in data collection when issues are repeated and further data collection becomes redundant; the same recommendation applies to content saturation, which requires at least five FGDs to achieve data saturation of 90%.[26] The number of groups was increased to achieve the point of data saturation within the analysis of subgroups that represent separate specialties of HCPs.

The semistructured interview guide was developed in accordance with the requirements of the Protocol, with the aim of collecting in-depth information on awareness, attitude and practices regarding the topic. The data was semantically coded to present the respondents' communications exactly as they were expressed, without any interpretation.[27 28]

12 FGDs and 10 in-depth semistructured interviews were conducted in July 2023 and were audio recorded with the prior participants' consent, confirmed by signing the informed consent form. All FGDs were held in rented coworking spaces in different macroregions of Ukrain (figure 1). Individual in-depth interviews were carried out remotely using various communication platforms (such as Zoom and Viber) at the discretion of the participant. 10 in-depth ISIs with HCPs were incorporated as an additional data collection method to the focus groups. These additional interviews were used to supplement and verify the information gathered and to receive the expert opinions of medical professionals.

The FGDs and interviews were conducted by three experienced moderators with sociological educational backgrounds, who have been actively involved in the public health sector in Ukraine for over 6 years and have extensive experience establishing communication with HCPs. Moderators were not a part of the research team.

Figure 1 Distribution of participants on the map of Ukraine. The red square boxes are indicative of the cities that represent each macro-region, in which focus group discussions (FGDs) were conducted.

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The data was triangulated, cross-checked and consolidated by an independent statistician who was not involved as author or moderator.

Before the start of the FGDs, participants were asked to complete a short questionnaire (online supplemental appendix 1). During the focus-group process, the moderators followed a structured guide that had the same outline for all HCPs but included some specific questions for each specialty (online supplemental appendix 2).

Data analysis

The investigators prepared 'Moderator's Notes' containing their observations, reflections, main ideas and insights, obtained during interviews or FGDs to support feedback that may have been overlooked in the transcript process. This was the initial step in data analysis. The investigators reviewed the notes and added questions or comments to a file for further discussion.

Data from questionnaires were transferred to Excel. FGDs and interviews were transcribed verbatim from digital records into Microsoft Word files. The transcripts and questionnaire data were entered into MAXQDA, a qualitative data analysis software, to systematise and code the data, merge codes into categories and create themes for thematic analysis.[29] In the process of analysis, a codebook was created. The main analyst supervised and coordinated the coding process. Iterative meetings were convened in order to discuss coding decisions and discrepancies observed during independent coding performed by two coders. Following the attainment of consensus, the codebook was refined and subsequently applied to the data set. The project team reviewed the digitised data and the information from transcripts for possible errors, consistency with the audio recordings and any personal information that could identify individuals. The data from the short questionnaire was analysed using descriptive analysis, with absolute numbers of responses and percentages presented. Additionally, a descriptive thematic analysis was conducted to identify the factors that the research participants considered important.

Patient and public involvement

There was no patient or public involvement in developing the objectives, designing the study or analysing the results.

RESULTS

As planned in the protocol, 12 FGDs with HCPs, including 15 paediatricians, 10 gynaecologists, 10 general practitioners (GPs), 15 nurses, 10 SLs and KDMs in different specialties (gynaecologists, GPs, paediatricians) were held during the field stage.

The study design employed a stratified sampling method to ensure equal representation from four macroregions of Ukraine (Centre, South, East and West), with each region comprising 15 participants (25.0%) (online supplemental appendix 3). However, this stratification resulted in a significant imbalance of medical specialties within the regional subgroups. For instance, the sample from the Central region consisted exclusively of gynaecologists and KDMs/SLs, whereas gynaecologists and nurses were entirely absent from the Western region's sample.

The sociodemographic profile of the respondents was characterised by a significant predominance of women (88.3%), a finding that partially reflects the general gender distribution in the Ukrainian healthcare sector, particularly in paediatrics and nursing (100% female in our sample). Key features of the sample included extensive professional experience and advanced age: 73.3% of participants had over 10 years of experience, and 56.7% were aged 46 or older, indicating that the target group consisted of seasoned professionals.

The majority of respondents (91.7%) were employed in the public healthcare sector, and 41.7% resided in large cities. Notably, the KDM/SL category—which comprised specialists from other fields (predominantly gynaecologists)—was entirely concentrated in large urban areas.

The analysis, conducted using the KAP framework, highlighted the following five themes for assessing general trends and the unique characteristics of each medical specialisation subgroup.

Knowledge of HPV, cancer development and vaccination principles

Most HCPs correctly identify HPV as a viral infection with the leading sexual route of transmission. Gynaecologists, paediatricians and GPs clearly distinguish between high-risk (16, 18 and others) and low-risk (6, 11) strains of the virus. Many are aware of the possibility of vertical transmission (from mother to child during childbirth) and contact-based transmission. HCPs emphasise that condoms significantly reduce but do not completely eliminate the risk of infection. SLs and gynaecologists clearly understand that the immune system of most infected individuals (especially young people) is capable of spontaneously clearing the virus within 1–5 years while the persistence of high-risk HPV is a major CC risk determinator. These facts present the basis for primary HPV screening. Superficial analysis of FGDs and interviews shows general confidence in long-term protection from CC and other HPV-associated cancers and skin warts, but a deeper view shows the presence of numerous misconceptions which may affect vaccination practice.

Misconceptions on preventive HPV vaccination and their sources

A prevalent misconception that adversely affects professional attitudes and clinical approaches to HPV vaccination was identified across all focus groups, including gynaecologists. This misconception is the belief that natural immunity and immune memory are formed after contact with HPV, a thesis that directly contradicts scientific data indicating the natural immune response to HPV is weak and fails to provide long-term protection.

> Infection, carriage, finale. And then immunity for life. Therefore, women who are 40+, they already had

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an HPV infection in their youth, whether they had dysplasia or not, whether they had cervical cancer or not. (FGD_gynecologist 10)

Women who are 40+, they already had an HPV infection in their youth… And then immunity for life. (FGD_gynecologist 4)

Furthermore, participants frequently asserted the futility of HPV vaccination for sexually active individuals. This belief was often accompanied by the conviction that screening for specific HPV strains is a necessary prerequisite before administering the vaccine to this population, though the mechanism for this requirement was rarely explained.

Previously, if an adult wanted to get vaccinated, it was necessary to do an HPV test – to see if they have the virus/if it's circulating or not. And only then do it. (FGD_gynecologist 5)

What's the point now? (in response to a question about vaccinating already infected individuals) (FGD_GP 3)

If an adult starts getting vaccinated, they need to be tested for the human papillomavirus. (FGD_Pediatrician 6)

Even for adults, from what I've read, if these strains are detected, it is no longer recommended to get vaccinated because it's pointless. (FGD_Pediatrician1)

Most medical professionals, with the exception of SLs, could not explain why natural immunity to HPV is weak. The knowledge of some HCPs regarding the efficacy and safety of HPV vaccines is fragmented and uncertain. Specifically, there is a belief that the immune response is short-lived and that the efficacy and safety of the vaccines are insufficiently studied.

And you don't get the shot for life. As I recall, it's for 5-6 years, and that's it. And then you have to do it again. (FGD_gynecologist 7)

We don't know, yes, about the consequences, the long-term consequences. (FGD_GP 2)

The analysis reveals significant gaps in healthcare workers' knowledge regarding eligible populations for HPV vaccination. Their perception of the vaccine is often confined to individual risk reduction, overlooking its role as a broader strategy for preventing HPV-associated cancers and achieving herd immunity. This limited view is exemplified by the common belief that vaccination is exclusively for girls, a position supported by justifications such as past female-focused health initiatives and the low incidence of penile cancer.

Well, they only do it for girls, not for boys. (FGD_GP 8)

Penile cancer is practically non-existent… That's the whole trick of the human papillomavirus. (FGD_gynecologist 10)

Prevalent misconceptions regarding the administration of various vaccines were identified, with participants' views often contradicting manufacturer instructions and other evidence-based sources.

Cervarix is for older ones. (FGD_gynecologist 8)

Doctors reported the prevalence of belief in myths about HPV vaccination among their colleagues, and some did not rule out a link between HPV vaccination and infertility themselves.

But there were some rumors that whoever gets vaccinated later has infertility. But then it was refuted… (FGD_gynecologist 7)

Infertility is possible. (FGD_GP 5)

Primary care physicians and nurses tend to associate HPV primarily with its cutaneous manifestations, such as warts, and often fail to consistently link the infection to its oncological risks.

Papillomas, warts – that's the association. (FGD_nurse 10)

We delved into the issue of knowledge sources regarding CC and HPV vaccination as one of the important determinants of specialists' qualification levels.

Gynaecologists, particularly those in larger cities and with more specialised practices, tend to use a mix of high-level scientific databases, international guidelines and professional networks. They frequently refer to international protocols and established medical databases for evidence-based information.

If it's information regarding vaccination… it's exclusively guidelines and international recommendations. (FGD_gynecologist 8).

I really like it – I always look at the Cochrane Library. (ISI_gynecologist 4).

The Ministry of Health, the Center for Public Health and the National Health Service of Ukraine are primary sources, along with international guidelines for paediatricians.

Center for Public Health, also information about vaccines from foreign medical sources… BMJ, for example. (FGD_pediatrician 4)

Conferences (both online and offline) and specific medical schools or leading experts are a key source of knowledge and updates for gynaecologists, paediatricians and GPs/therapeutists. Although the latter state that the issue of HPV vaccine is not presented enough.

The (Name of Opinion leader) School - it deals with the pathology of the cervix… (Name of Opinion leader) The Kyiv school as well. (FGD_gynecologis 3)

In other words, they might say something at a conference here or there, but only as an afterthought. It's mentioned very briefly, yes. (ISI_GP 1)

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All HCPs mention the use of modern digital resources, including social media and expert-led YouTube channels, to inform themselves and their patients. Doctors use both professional medical platforms and publicly available resources, including social media.

> …a very, very cool YouTube channel run by (Name of Opinion leader) in Dnipro. And he has very cool, accessible… information for patients. (FGD_gynecologist 8).

> I get information from posts on Facebook and Instagram by colleagues I trust, who are evidence-based doctors. (FGD_pediatrician 9).

Pharmaceutical representatives also act as a source of information about specific vaccines and medical drugs.

> …I call the (Company name) representative and find things out from him. (FGD_gynecologist 8).

An important source is the exchange of experience with trusted colleagues. Paediatricians and family doctors often rely on the knowledge of gynaecologists.

> We ask, we inquire, we share experiences, well, something like that… (FGD_GP 10)
>
> For example, regarding the human papillomavirus, I will most likely read up on it from a gynecologist: they know much more about it—including about vaccination. (FGD_pediatrician 2)

In some cases, particularly in more rural or hierarchical settings, information is passed down from management.

> Well, since we are medical workers, all this is communicated to us by the management… Orders, operational meetings. (ISI_pediatrician 5).

There is a significant deficit of clearly articulated evidence-based recommendations, particularly among primary healthcare providers.

> We need to ensure that information is not subject to individual interpretation by every doctor. (FGD_GP 9)

We can summarise that Ukrainian HCPs rely on a diverse range of information sources which are often inconsistent in quality regarding the theoretical foundations and practical application of HPV vaccination.

Attitudes to HPV vaccination situation in Ukraine globally and in a gender-neutral context

There is overwhelming support for HPV vaccination among the surveyed HCPs, who view it as a critical tool for cancer prevention. Many HCPs actively recommend the vaccine, with some, particularly SLs, being strong personal advocates who have vaccinated themselves and their families. A predominant theme in the discussions was the clear and consistent understanding among HCPs that men are significant carriers of HPV. This establishes the core argument for gender-neutral vaccination: to break the chain of transmission and protect the entire population, not just women. Vaccinating boys is therefore framed as an essential public health strategy for achieving herd immunity and protecting their future female partners from CC and other HPV-related diseases.

This perspective was articulated by specialists across different regions and fields. A gynaecologist from Kyiv, who is a vocal proponent of vaccination, explicitly labelled men as the primary source of transmission, stating:

> Therefore, men are a reservoir of infection. It is proven that men are a reservoir for types 16 and 18 and do not get penile cancer, prostate cancer, or anything else associated with this virus. They are a reservoir for types 6 and 11. (ISI_gynecologist 5).

There are advocates of gender-neutral vaccination among GPs too.

> I tell all my patients that boys should also be vaccinated. Some people do get vaccinated. I have vaccinated boys. (FGD_GP 2).

This view was echoed by a paediatrician in a focus group with Odesa-based paediatricians from rural areas, who highlighted that boys often carry the virus without symptoms, posing a risk to their partners.

Thus, the attitudes of HCPs to gender neutral HVP vaccination are generally positive and probably correlate with knowledge depth.

Barriers and facilitators for HPV vaccination in Ukraine in HCPs' practice

Barriers to HPV vaccination coverage in Ukraine exist at all levels, from the organisation of the healthcare system to the personal beliefs of both physicians and patients. We identified three main groups of barriers:

- Barriers from the healthcare system (organisational).
- Barriers in HCPs' practice.
- Barriers on the part of the population (awareness and attitudes of parents and young adults).

Organisational barriers within the healthcare system are fundamental. The most significant among them at the time of the study was the absence of a robust national programme and the non-mandatory (optional) status of the vaccine. Physicians are unanimous that the vaccine's recommended status, as opposed to mandatory, significantly lowers its priority for both healthcare providers and patients. The lack of a centralised, well-funded national vaccination programme makes prevention efforts chaotic and dependent on local initiatives or commercial procurement.

> HPV vaccination is not included in the national immunization schedule as mandatory. Only as recommended. (FGD_gynecologist 4)

With the exception of a few local programmes where vaccination was funded by a city's budget, the population must cover the cost of the vaccine themselves. Furthermore, vaccines are not consistently available in

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the medical facilities that conduct vaccinations, and parents or young adults often have to order them from a pharmacy. Physicians expressed concerns about being suspected of having a financial interest in recommending a non-mandatory, paid vaccine.

An important organisational insight is that paediatricians who play a key role in timely precoital vaccination are less often visited by children after 6 years of age. And the only way to notify parents about HPV vaccination is during visits with limited time and no hand-outs on the topic. Paediatricians then tend to transmit responsibility to gynaecologists, but the latter can promote mainly catch-up vaccination. Also, gynaecologists can promote precoital vaccination via informing mothers.

Barriers faced by HCPs are related to the professional knowledge, working conditions and personal convictions of physicians and nurses. A key issue highlighted is a knowledge gap and lack of confidence, particularly among non-gynaecological specialists. Many paediatricians and family doctors admit to insufficient knowledge about HPV, especially regarding the choice between different vaccines, age limits for adults, vaccination for boys and protocols for non-standard situations. This uncertainty makes them vulnerable to patient objections and less proactive in their recommendations.

> Insufficient knowledge. I would like the child to be consulted by an immunologist together with us, you know? (FGD_ pediatrician 9).

The professional environment also presents significant obstacles. Physicians consistently report a lack of time for educational work due to heavy patient loads and short appointment slots (often just 15 min). This is compounded by a lack of official, patient-friendly informational materials they can provide. The latter factors can also be attributed to the organisational group of barriers since they depend on the government. This pressure creates a risk of professional burnout and a growing indifference towards promoting a non-mandatory vaccination despite the awareness of its importance.

Another aspect on the verge of healthcare organisation and HCP practice is a strong demand for improved postgraduate education and clear, evidence-based national guidelines. Physicians feel that official, unified national recommendations would not only serve as a basis for proper clinical practice but also provide crucial legal support for their actions, reducing their fear of liability when recommending this kind of prevention.

Barriers from the population encompass the attitudes, beliefs and socioeconomic conditions of the people. A primary barrier is the low level of public awareness and problem recognition. The vast majority of the population is unaware of the direct link between HPV and cancer, often perceiving it as a minor issue. This lack of understanding of the problem's seriousness leads to low motivation for vaccination.

> To be honest, if you compare it with all other diseases, this is probably the least of all. (FGD_pediatrician 10)

A general mistrust of vaccines and the medical system is a phenomenon noted as specific to the Ukrainian context. HCPs report that patients express fears about the quality of vaccines, their storage conditions (the 'cold chain"), and potential side effects, with myths linking vaccination to infertility and autism being prevalent. This mistrust extends to the entire healthcare system. Also, the difference in price of the two- and quadrivalent vaccines raises questions and suspicion of potential recipients.

> Patients don't like the price, because there is such and the other, and the price is actually twice as different. Which one is better? (FGD_SLs/KDMs 1)

Religious beliefs and the influence of antivaccination movements are also present in Ukraine to some extent. In some regions, the stance of religious communities opposing any vaccination is a strong barrier. Influencers who spread disinformation through social media also have a significant impact.

> Religious reasons. I had parents like that who didn't get vaccinated for anything at all. They had their own community. (FGD_nurse 14)
>
> That's why these parents—and I understand them—for example, if they have a child with autism or with some other problems, they seek help everywhere. And specialists in alternative medicine almost always say that the cause is vaccination. Almost always! (FGD_pediatrician 10)

Interestingly, HCPs did not mention the myth about vaccination accelerating the sexualisation of adolescents or the issue of future refusal of screening. Representatives of marginal religious groups object to vaccination in general, not just against HPV.

Young women who are eligible for catch-up vaccination are influenced by the same misconceptions as physicians: the necessity of an HPV test to make a decision about vaccination, and the inadvisability of vaccination in the case of a positive HPV test.

HCPs identified several factors they believe contribute to the success of vaccination programmes: patient awareness; trust in the physician; experience living abroad; vaccination provided through state-funded programmes.

Patient awareness and risk perception were highlighted as key motivators. The most powerful incentive for vaccination is an understanding of the link between HPV and cancer. Patients who possess this information—often through personal experiences or those of close people—tend to actively seek out opportunities for vaccination.

> When someone in the family becomes ill or has a related condition, they start worrying about their own health. But that's a relatively small percentage. (FGD_gynecologist3)

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Long-term, positive relationships with healthcare providers, particularly when physicians can confidently and convincingly recommend vaccination, significantly increase patient adherence to such recommendations.

> If you've worked with them for a long time and they trust you and know you, they usually listen to what you say. (FGD_nurse 5)

Patients who have lived in European countries where HPV vaccination is mandatory and free of charge tend to return to Ukraine better informed and more motivated to receive the vaccine.

Experience from local initiatives (eg, in Kyiv or Rivne) demonstrates that the introduction of free vaccines substantially increases demand and fosters positive public attitudes.

> Now it's more frequent, since the municipal maternity hospital, the perinatal center, introduced this campaign… Before, I'd have mothers asking about the vaccine maybe once every three or four months, and now it's five a week! (FGD_pediatricians 4)

> Especially when the vaccine is free… There was an actual queue. (FGD_GP 1)

Analysis of the impact of the war on HPV vaccination in Ukraine

Focus groups and in-depth interviews with HCPs demonstrate the complex and multifaceted impact of the full-scale war on the state of HPV vaccination in Ukraine. This impact encompasses pronounced negative effects as well as several unexpected positive and ambiguous aspects:

- Shift in public priorities and decreased demand.
- Disruption of logistics and access to medical services.
- Migration of the population and physicians.
- Increased risks of infection and disease progression.
- Increased awareness through experience abroad.
- Humanitarian aid and the emergence of new programmes.

The most evident consequence of the war has been a shift in priorities for both patients and the healthcare system. The issue of preventing long-term risks, such as HPV-associated cancers, has been relegated to the background compared with immediate concerns of survival, safety and the treatment of acute conditions.

> Well, during a time of war, when we don't know what tomorrow will bring, I don't think this is a very relevant issue. People are surviving right now, mostly, and in the villages, it's even more so! They are not thinking about the future. They just need to get through today! (FGD _gynecologist 7)

The war has caused significant logistical problems and limited access to medical services, directly affecting vaccination efforts. Interruptions in vaccine supply: HCPs note that while there is no global shortage of vaccines from the national schedule, temporary interruptions occur, especially for non-priority vaccines.

> We make an order, we receive less vaccines. Almost always. (FGD_ GP 1)

Breaches of the 'cold chain' due to Russia's terrorist destruction of infrastructure mainly due to power outages have raised serious concerns among HCPs and patients about maintaining the proper storage conditions for vaccines, undermining trust in their quality and safety. Unstable operation of medical facilities due to continuing air raid alerts forces the interruption of patient appointments, complicating the scheduling of vaccination visits, as mentioned by HCPs. Mass internal and external migration has disrupted established doctor–patient relationships and complicated the maintenance of medical records. Often, medical cards and vaccination histories are inaccessible. In some regions, the absence of HCPs due to migration or mobilisation has led to staff shortages and an increased workload for those who remain. Migration of the population to the western part of Ukraine caused HCPs' overload there.

Physicians express serious concern that the consequences of the war could lead to an increase in the incidence of HPV-associated pathologies in the future. The theoretical arguments are: chronic stress and complex war trauma suppress the immune system, which can facilitate the activation of a latent HPV and decrease the chances of spontaneous clearance. Another mechanism is numerous cases of sexual violence in occupied territories and the increase of risky sexual behaviour among the population.

Paradoxically, the forced migration of a portion of the Ukrainian population to countries in Europe and North America has had a positive impact on their awareness of HPV vaccination. Patients who encountered the fact that this vaccination is mandatory and free in other countries are returning to Ukraine more informed and motivated, with specific inquiries for their GPs, paediatricians and gynaecologists.

> Those who went abroad, to Poland, Germany, they are mostly already returning after six months. And I see that they simply have many vaccinations, including for HPV. (FGD_GP 6)

The war has spurred the activity of international and volunteer organisations. HCPs mentioned pilot projects and humanitarian supplies of vaccines, which, while not solving the problem systemically, create precedents and raise awareness.

The full-scale war has significantly complicated the situation regarding CC prevention in Ukraine. It has exacerbated pre-existing systemic problems: high costs, the lack of a national programme and low public awareness. The shift in priorities, logistical disruptions and migration processes have created additional barriers to vaccination. At the same time, the war has had indirect consequences. The experience of Ukrainians abroad has raised awareness and created a demand for civilised approaches to prevention. Physicians recognise the growing long-term

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risks to the nation's health and, despite all difficulties, emphasise even greater importance of implementing systematic, accessible and mandatory HPV vaccination as a crucial element in preserving the health of future generations.

DISCUSSION

This qualitative study provides an attempt at comprehensive exploration of the awareness, attitudes and clinical practices of Ukrainian HCPs regarding HPV and its vaccination, situated within the complex landscape of systemic healthcare challenges profoundly exacerbated by the full-scale war initiated by the Russian Federation. Our findings suggest that while HCPs, particularly gynaecologists and SLs, possess a strong foundational knowledge of HPV's oncogenic risks, implementation of vaccination into widespread preventive practice is impeded by a complex interplay of organisational, professional and societal barriers. The planned introduction of HPV vaccination into Ukraine's NCPI in 2026 represents a critical policy shift, but its success will be contingent on addressing the deeply rooted challenges, some of which were uncovered in this research.

The organisational barriers highlighted by Ukrainian HCPs in our study align closely with challenges documented in other LMICs. As noted by Khosravi *et al*, the absence of a robust, state-funded national immunisation programme is a primary impediment.[19] Our participants unanimously identified the vaccine's non-mandatory (optional) status and high cost as the most significant barriers, which drastically limit access for the general population and reduce the perceived urgency of the intervention. The sentiment that 'if it were mandatory, this problem wouldn't exist" (FGD_pediatrician_city) encapsulates the belief that a firm state-level policy is essential to overcome patient financial constraints and prioritise HPV prevention on a national scale. This is consistent with the success seen in high-income countries, where government sponsorship and inclusion in the national programmes have led to high coverage rates.[25 30 31] The logistical challenges and inconsistent availability of vaccines in state clinics further underscore the systemic fragility that must be resolved before a national rollout. It is necessary to create a system for recalling children for vaccination within the planned state programme. Many countries successfully solved this issue with the help of school immunisation.[32] Additionally, an information campaign is necessary to inform the public about catch-up vaccination, which for now will not be covered by the state. Studies showed the efficacy of contemporary digital technologies in this aspect.[33]

The study points to what appears to be a notable knowledge-practice gap within the medical community. This is particularly relevant for paediatricians and GPs, given their influential position in determining who receives precoital vaccination. While generally supportive of the vaccine, their knowledge looks fragmented, with prevalent misconceptions regarding natural immunity, the efficacy of postexposure vaccination and vaccine safety. The belief that natural infection confers lifelong immunity directly contradicts established virological principles and likely undermines the perceived necessity of vaccination. Prevaccination screening for high-risk HPV in sexually active teenagers and young women is clinically unjustified. This practice offers no diagnostic or therapeutic benefit, creates unnecessary financial burdens and delays crucial vaccination. A similar problem was reported in the qualitative study from Ghana, a country that also does not have strict national policy of HPV vaccination.[34] This misconception is not unique to Ukraine; studies in the USA, Switzerland and Poland have similarly reported discrepancies between clinicians' supportive attitudes and their actual recommendation practices, often due to a lack of confidence and detailed knowledge.[20 35 36] The expressed need for clear, unified national guidelines is therefore not just a request for information, but a call for the legal and professional framework required to recommend a non-mandatory vaccine with confidence. The time pressure of 15 min appointments further limits the capacity for the in-depth counselling necessary to address patient hesitancy. The described situation goes in line with the results of qualitative analysis of providers' perceptions by Perkins and Clark that impeded vaccination included safety concerns, a low perceived severity of HPV disease, lack of school mandates and policies against coadministration of HPV and meningococcal vaccines.[37]

From the perspective of the population, the barriers are deeply rooted in sociocultural factors. Pervasive mistrust in the healthcare system and vaccines remains a significant challenge, fuelled by events like the 2008 measles vaccine controversy in Ukraine and rooted in a broader legacy of scepticism noted across post-Soviet nations.[38] This is fuelled by misinformation, particularly myths linking vaccination to infertility and autism, which were mentioned by both physicians and nurses as common patient concerns. Our findings show that religious objections and the influence of anti-vaccination figures, while perhaps not widespread, represent a significant barrier in certain communities, a trend observed globally.[39 40] It is noteworthy that while HCPs in our study did not report encountering the myth of vaccination promoting earlier sexual debut or sexual promiscuity, they consistently identified a profound lack of public awareness about the fundamental link between HPV and cancer. This knowledge deficit may represent a critical barrier, as understanding this connection is a strong motivator for patients to accept vaccination.

The ongoing war introduces a unique and complex dimension to this landscape. As articulated by HCPs, the conflict has shifted national and personal priorities towards immediate survival, relegating preventive health to the background. Logistical disruptions, power outages threatening the cold chain and mass migration have created additional obstacles to immunisation.[2 41] However, our study discovered that the war has also had

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a paradoxical effect. The experience of Ukrainian refugees in European countries, where HPV vaccination is standard and state-funded, has served as a powerful educational tool. Patients returning to Ukraine seem to be better informed and more motivated, creating a new, grassroots demand for the vaccine. At the same time, Polish and Italian observations confirm a high level of vaccine hesitancy and low awareness of HPV vaccination in Ukrainian refugees represented mainly by females.[42–44] This finding suggests that exposure to functional, well-organised healthcare systems can effectively counteract local misinformation and apathy. HCPs also suggested a possible rise in HPV-associated genital cancers as a result of sexual violence, behavioural changes, ecological effects of war and chronic stress. The increase of sexually transmitted infections risk and their adverse effects association with armed conflicts and migration seems obvious, but in fact, it is not studied enough, as shown in a systematic review by Kvasnevska *et al*.[45] Postponed effects of post-traumatic stress disorder as a complex neuroimmunoendocrine disorder on HPV-associated cancer risks may prove to be significant and require further research.[46]

Undoubtedly, the ongoing Russia-Ukrainian war effects are much more complex than our study could reflect.

Limitations

This study has several limitations. Qualitative design, while providing depth, does not allow for statistical generalisation. The stratified sampling resulted in regional imbalances in medical specialisations, which may have skewed the perspectives from certain areas. Furthermore, the study focused exclusively on the HCP perspective; a comprehensive understanding would require complex analysis of the attitudes and beliefs of the general population, parents and adolescents. It has to be admitted that setting the goal of assessing the impact of war on vaccination process was too ambitious for a qualitative study like this. As expected, its influence is robust and multifaceted and requires specially designed methodology with inductive or hybrid approach to data analysis.

CONCLUSIONS AND IMPLICATIONS

The successful implementation of Ukraine's national HPV vaccination programme in 2026 requires a multipronged strategy that addresses the systemic, professional and societal barriers identified in this study. Merely including the vaccine in the national calendar will be insufficient without robust state funding to ensure it is free at the point of care. A large-scale, multichannel public information campaign is urgently needed to educate the population about the link between HPV and cancer and to counteract pervasive misinformation.

Critically, targeted continuing medical education must be developed for paediatricians and family doctors to close knowledge gaps and build their confidence in recommending the vaccine. The creation and dissemination of clear, evidence-based national clinical guidelines will provide the necessary professional and legal support for HCPs.

Full-scale war initiated by the Russian Federation in 2022 is an unprecedented historical fact in the 21st century. Generally destructive, its multifaceted effect on healthcare and community has multiple unique aspects that need to be addressed with a specifically designed methodological approach.

Acknowledgements We would like to thank all participants who took part in FGDs and interviews and provided data for analysis. We thank the funders of our research and colleagues involved in the conduct of the study.

Contributors TTa contributed to the design of the research and research supervision. LK, SR and VD performed the literature search. LK, YA, YT and TTu provided technical help and drafted the manuscript. All authors read, edited and approved the final manuscript. TTa is the guarantor.

Funding This research was funded by Merck Sharp & Dohme LLC, a subsidiary of Merck & Co, Rahway, New Jersey, USA.

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Competing interests Study materials for this manuscript were provided by Merck Sharp & Dohme LLC, a subsidiary of Merck & Co, Rahway, New Jersey, USA. All authors have no competing interest to declare.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This research involves human participants and ethical approval was granted by the Institutional Review Board of the Public Health Centre of the Ministry of Health of Ukraine (IRB2023-89) on 19 June 2023. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request.

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